

REMARKS

Favorable reconsideration of this application, as presently amended and in light of the following discussion, is respectfully requested.

Claims 1-13 are currently pending. Claims 7-13 have been amended by the present amendment. The changes to the claims as supported by the originally filed specification and do not add new matter.

In the outstanding Office Action, the Abstract was objected to regarding the use of the word "said"; Claims 8-13 were objected under 37 C.F.R. §1.75(c) as being in improper form; Claims 1-9 were rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent 6,233,709 to Zhang et al. (hereinafter "the '709 patent") in view of U.S. Patent 6,289,486 to Lee et al. (hereinafter "the '486 patent"); and Claims 1-13 were provisionally rejected under the judicially created doctrine of obviousness-type double patenting over Claims 1-19 of copending Application Serial No. 10/093,495 (hereinafter "the '495 application").

In response to the objection to the Abstract, the Abstract has been amended to no longer use legal phraseology. Accordingly, the objection to the Abstract is believed to have been overcome.

Applicants respectfully traverse the objection to the claims under 37 C.F.R. § 1.75(c). Nothing in that rule states that dependent claims must refer to another claim only in the preamble. However, Applicants note that Claims 8-10, 12, and 13 have been amended as suggested in the Office Action. Accordingly, the objection to Claims 8-13 is believed to have been overcome.

Claim 1 is directed to a method of optimizing a size of coded data blocks intended to be subjected to an iterative decoding process, wherein a maximum acceptable error rate of the iterative decoding process is fixed in advance, comprising: (1) determining a submultiple block size among a plurality of integer block sizes N/k , which are submultiples of an integer

block size N by an integer factor k greater than or equal to 1, wherein k is a factor of N ; and
(2) determining a maximum number of iterations among a plurality of integers corresponding to a maximum number of iterations to be applied by the iterative decoding process on a coded data block, based on the maximum error rate, and such that a mean number of iterations that will be applied by the iterative decoding process on the submultiple size block is minimized.

Regarding the rejection of Claim 1 under 35 U.S.C. §103, the Office Action asserts that the '790 patent discloses everything in Claim 1 with the exception of "the specific use of determining the frame length N/k ,"¹ and relies on the '486 patent to remedy that deficiency.

The '709 patent is directed to a method and apparatus for iterative decoding of a coded information signal that allows quality of service parameters to be dynamically balanced in a telecommunications system. In particular, the '709 patent discloses a method for determining the minimum and maximum number of decoding iterations to be performed on an information signal based on a bit error rate value. However, regarding block size, the '709 merely discloses that the coded information signal is in the form of data frames. Thus, as admitted in the Office Action, the '709 patent fails to disclose determining a submultiple block size among a plurality of integer block sizes N/k , as recited in Claim 1.

The '486 patent is directed to an adaptive channel encoding method and device. As shown in Figure 8, the '486 patent discloses an interleaving process of reordering an input bit sequence using an $M \times N$ matrix. Further, the '486 patent discloses that "to implement diagonal interleaving, the $M \times N$ value is designated from the diagonal interleaving table on the basis of the input frame data size k ."² As shown in Table 1, the '486 patent disclose that the input data and the first diagonal interleaver output are tabulated in $M \times N$ matrices. However, Applicant respectfully submits that the '486 patent fails to disclose the step of determining a submultiple block size among a plurality of integer block sizes N/k , as recited

¹ See page 5 of the Office Action dated March 1, 2005.

² '486 Patent, column 6, lines 18-21.

in Claim 1. Rather, the '486 patent merely discloses the use of an $M \times N$ matrix (based on the input frame data size k) to perform interleaving using Equation 1 shown in column 6 of the '486 patent. In other words, the '486 patent discloses that the frame size is fixed.

Moreover, Applicant notes that the '486 patent is directed to an interleaving method used with an encoder, and is not directed to a method of optimizing a size of coded data blocks intended to be subjected to an iterative decoding process, as recited in Claim 1.

Thus, no matter how the teachings of the '709 and '486 patents are combined, the combination does not teach or suggest determining a submultiple block size among a plurality of integer block sizes N/k , as recited in Claim 1. Accordingly, Applicant respectfully submits that a *prima facie* case of obviousness has not been established and that the rejection of Claim 1 (and dependent Claims 2-9) should be withdrawn.

In the outstanding Office Action, the stated motivation for combining the teachings of the '709 and '486 patents is "because one of ordinary skill in the art would have recognized that use of determining the frame length N/k would have provided the opportunity to use an interleaver that maximizes a minimum hamming distance of the turbocode in terms of a block code (column 2, lines 55-57 in Lee)."³ However, Applicant respectfully submits that the statement quoted from the '486 patent refers to a preferred property of an interleaver, and is unrelated to a decoder, and furthermore does not relate to the selection of a size of a block to be decoded. Accordingly, Applicant respectfully submits that the Office Action has failed to provide the requisite motivation to combine the teachings of the cited references.

Accordingly, for this additional reason, Applicant respectfully submits that a *prima facie* case of obviousness has not been established and that the rejection of Claim 1 (and dependent Claims 2-9) should be withdrawn.

³ See pages 5 and 6 of the Office Action dated March 1, 2005.

Applicant respectfully traverses the rejection of Claims 1-13 under the doctrine of obviousness-type double patenting over claims in the '459 application. Applicant notes that Claim 1 of the '459 application recites the step of evaluating a resource available for decoding of a block of size n, which is not recited in amended Claim 1. Further, Applicant notes that claims in the '459 application do not recite the step of determining a maximum number of iterations among a plurality of integers, as recited in Claim 1 of the present application. Accordingly, Applicant respectfully submits that Claim 1 of the present application is patentably distinct from the claims in the '459 application.

Thus, it is respectfully submitted that Claims 1-13 patentably define over any proper combination of the '709 patent, the '486 patent, and the '459 application.

Consequently, in view of the present amendment and in light of the above discussion, the outstanding grounds for rejection are believed to have been overcome. The application as amended herewith is believed to be in condition for formal allowance. An early and favorable action to that effect is respectfully requested.

Respectfully submitted,

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